FILTAKLEEN
Oil Filtration Systems

Filtakleen By-Pass Oil Filter

INSTALLATION & SERVICE MANUAL

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INTRODUCTION

The Filtakleen By-Pass oil Filter is an ultra-fine 1 micron Bypass filtration system suitable for use with a wide range of equipment.
It provides the best possible filtration protection against system wear, oil degradation, rust and corrosion. Working in conjunction with the equipments full flow filter, the Filtakleen By-Pass Filter removes any particles in the oil likely to cause system damage. The Filtakleen Bypass Filter typically filters all the oil in the system several times an hour, so the system continuously receives analytically clean oil.

What are the benefits of the Filtakleen Bypass Filtration?

- An extension of Oil Drain and Filter Change Intervals
- An improvment of Oil cooling
- An increase of filtration quality and so an extension of the engine life
- An increase in the fluid system capacity
- An efficiencient removal of small particle and soot
- Reduced cost of oil and full flow filters
- Less wear (up to 90%)
- 1-Micron filtration
- 100% water removal

TÜV UKQA GB 001995 IMS IS7098 ISSUE 4

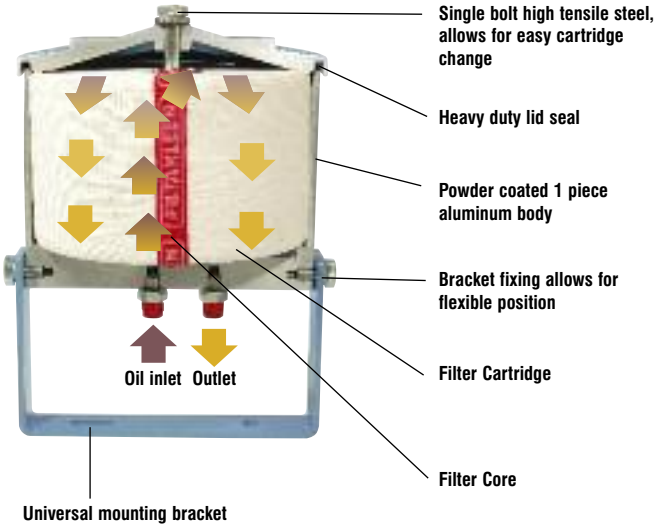
INTERLUBE
Leaders in Lubrication Solutions

SYSTEM DESCRIPTION

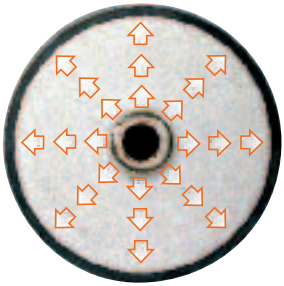
The By-Pass filter is designed to be used in conjunction with the main in line filter. The system continuously filters a percentage of the oil, typically 10%, in the circuit which means it is able to provides additional filtration to a much finer tolerance than the in-line filter. This greatly prolongs the life of both the oil and the main filter itself.

The filter housing is manufactured as a one piece aluminium anodised body which is powder coated, making it suitable for all environments, and offering total durability. The lid is secured by a single high tensile bolt which makes lid removal and filter changing quick and easy. The lid houses an quad ring seal giving completely leak proof sealing.

The filter cartridge is made from a cellulose fibre based tissue of pure pulp, around a cardboard core.
The cartridge is housed in a nylon stocking with an impressed brass ring to facilitate cartridge removal. The filter housing is fitted using an adjustable mounting bracket, which offers the installer a wide range of filter positions and fixing points. The filter is capable of filtering all types of oils with a viscosity range of 9-220cst. It is also suitable for use with other mediums such as bio fuels and dielectric fluid


Single bolt high tensile steel, allows for easy cartridge change
Heavy duty lid seal
Powder coated 1 piece aluminum body
Bracket fixing allows for flexible position
Filter Cartridge
Filter Core
Oil inlet
Outlet
Universal mounting bracket

Oil flow in filter



Operation

Oil enters the filter via the inlet point and passes up through the core of the filter. The oil then percolates slowly down through the filter medium, through the outlet, and is returned to the system. Systems for hydraulic oils will have a pressure reducing manifold fitted to the bottom of the filter body. This reduces to reduce down the high pressures of a hydraulic system to the operating pressure of the filter. Engine oil systems have no need for the manifold as they operate at much lower pressures. The standard operating pressure of the filter is approx 5 bar. The manifold incorporates a pressure relief valve which is factory set at 65psi / 4.45bar. The manifold has a test point for the attachment of fluid monitoring equipment. A pressure gauge is available as an option.

SYSTEM COMPONENTS

The correct size filter for the application should be confirmed by referring to the application table on page10. The filter kit comprises a filter assembly including mounting bracket, filter cartridge, and a range of fittings as listed below. The system is designed to be installed with ?" inlet hose, and 3/8" outlet hose, and fittings to suit this size hose, plus connections into the filter are provided. With hydraulic systems a ball valve and pressure reducing manifold are included.

Maxi Duty Hydraulic Kit

Bantam Engine Kit

The following fittings are supplied as part of a kit

Hydraulic Kit

		Qty
17-17067A	Ball Valve 1/4 bsp	1
17-17070	R/U 3/8 Swept Elbow	1
17-17055	R/U RIT 3/8 Ferrule	2
17-17092	R/U 1/4 Swept Elbow	1
17-17054	R/U R2T 1/4 Insert	1
17-17052	R/U 1/4 Insert	1
17-17072	R/U 3/8 Insert	1
17-17060	R/U 3/8 90 Degree Elbow	1
17-17069	1/4 90 Degree Swivel Adaptor	1
17-17091	R/U 1/4 90 Degree Compact Elbow	1
17-17016A	Manifold block	1

Engine Kit

		Qty
17-17092	R/U 1/4 Swept Elbow	2
17-17052	R/U 1/4 Insert	2
17-17076	1/4 BSP 1/4 BSP Male Adaptor	2
17-17074T	1/8 BSP 1/4 BSP Male Adaptor	1
17-17056	R/U RIT 1/4 Ferrile	4

Hose and tubing do not come with the kit, and can be ordered separately, please refer to page 11

Please note that additional fittings will be required for installation, the size and type of which will vary according to the equipment on which the system is to be fitted.

SYSTEM INSTALLATION

In principle the take off point should always be on the main system feed, after the pump. It can be either before or after the main in-line filter.

In engine oil the temperature can be as high as 120°C. Hoses with single steel braiding and temp spec of 150°C continuous should be used.

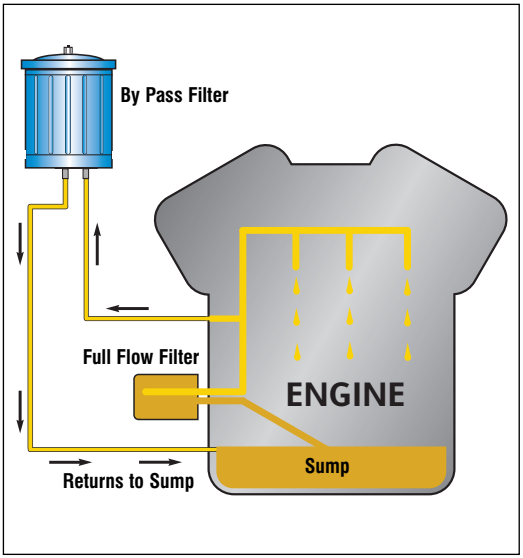
Hydraulic oil temp is normally not more than 80°C so the emphasis here is pressure. Modern construction equipment uses up to 450 bar pump pressure, which can be handled by the Safety Manifold. But the hose must be 2 steel inlays with working pressure of at least 650 bars, to compensate for peak pressure.

Mounting the units

Preferably the units should be mounted with the lid above the liquid level in the hydraulic tank or the motor oil sump. This because in the return lines there are non-return valves and the liquid could overflow the bowl when opening the lid for cartridge change. Also the units should be easily accessible from the front, again for easy change of cartridge.
And lastly, there must be enough space above the unit to accommodate the cartridge change.

Brackets should be bolted to the frame of the equipment. Welding is an option, but some modern equipment has sophisticated computers, which must be unplugged completely, before welding starts.

Engine system fitment



Entry Points

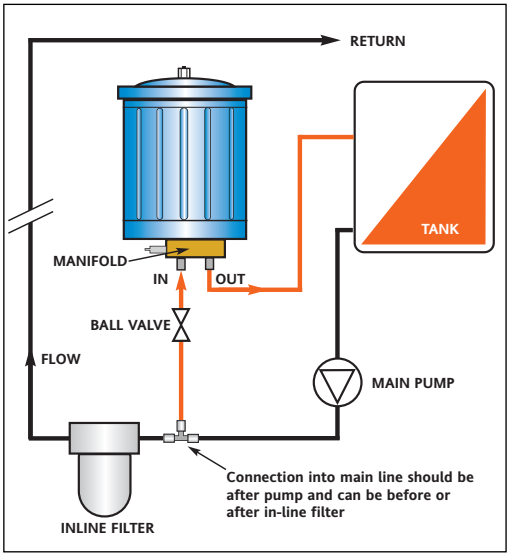
Engine oil Systems

Usually located in the oil gallery, many engines have unused plugs here, or on the oil filter housing. Another option is to remove the oil pressure sensor and refit a T-piece adaptor.
The turbo lubrication is usually fed via a banjo-bolt, which can be replaced by one with an external inlet. A mechanical fuel pump is fitted with a banjo-bolt lubrication line too, which can also be replaced by one with an external inlet. And if necessary, the compressor lubrication can be used. Each individual situation will show which is preferable.

Hydraulic Oil Systems

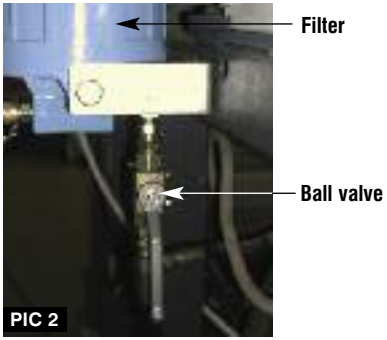
The pressure should be taken from the main pump circuit, as this is the system which will have the most working hours, (if more than one pump is fitted). The units can be fitted to high pressure systems, up to a maximum of 9000 psi. Use of this circuit maximises the time available for effective filtration. Typically this pump has overcapacity, so that the oil stream taken to the by-pass filter will not influence the performance of the system. Never take the pressure from a servo or pilot circuit, because one cannot predict if certain functions of the system will be adversely influenced. This may even be dangerous. Hoses must be rated for the operating pressure of the equipment.

Hydraulic system fitment



In the majority of cases, on the pressure side of the main pump, there is a pressure test nipple, which can be taken out and refitted with a T-piece. If not, this nipple is situated on the first valve block in the pump pressure line. Sometimes the pump or the valve block has loose plugs, which can be replaced by an adaptor.

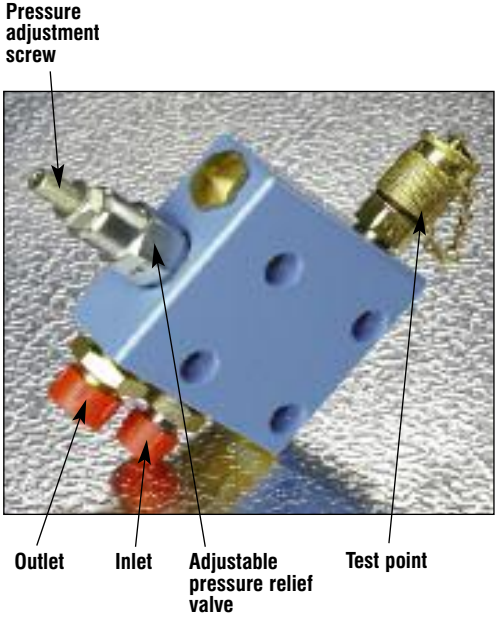
If none of these exist somewhere in the main pressure line, a fitting such as a T- piece or elbow can be used (e.g. Pic 1). it should be taken off and drilled and threaded to take a suitable fitting. The ball valve can be positioned anywhere in the line from the take off point up to the filter (Pic 2).



When working on a hydraulic system it is preferential to have the tank air pressure relieved or even better if a vacuum pump is placed on the tank filler opening to maintain under pressure in the tank and system while working. This helps to prevent awkward oil spills.

Pressure Reducing Manifold

The relief valve is factory set at 65psi as this is the most effective setting for filtration. However in the event of adjustment being necessary, connect a pressure gauge to the test point. Turn clockwise to increase pressure setting, and anti-clockwise to reduce.



Return points

In general there must not be any backpressure in the return line such as orifices, partial pressures in pilot systems, etc. The outlet of the by-pass filter should be zero pressure.

Engine oil systems

Return points can be found in unused plugs on the sump (if this is below liquid level use a vacuum pump on the oil filling point).
Alternatives are:

- the return of the turbo lubrication to the block is sometimes a banjobolt, which can be replaced.
- on the sump rim is a plug for a second sounding rod on the opposite side of the block.
- the oil-filling pipe can be removed, drilled and threaded to fit an adaptor.
- the valve cover can be removed, drilled and fitted with an adaptor. See that the adaptor outlet is above the camshaft rod and not over the valve stem. This results in excessive oil consumption.

Hydraulic oil systems

Return points can be found on the tank return manifold in unused plugs.
Alternatives are:

- an extra coupling can be drilled, threaded and fitted with an adaptor, can interrupt leakage lines.
- lines such as knee bends or bulkheads feeds be removed, drilled and threaded.
  Remember this is all low pressure, where some hydraulic seal compound is enough to prevent oil spill.

Post Installation:

Once the installation is complete, check that all connections are secure. Confirm that the inlet (pressure) and outlet (return) hoses are connected to the correct ports in the filter housing, as failing to do this will result in inefficient filtering and oil to leak from the lid of the filter housing. Make sure all pipes are secured tightly i.e. with tie wraps, especially near the inlet and outlet adaptors. Run the engine or equipment making sure that there are no oil leaks and that oil is passing through the filter.

CHANGING THE FILTER CARTRIDGE

On Engine systems engine should be switched off
On hydraulic systems turn ball valve to off position (pic 1). The machine need not be switched off.
Undo lid bolt, allowing air to enter system. (pic 2) If the units are mounted above tank level, the bowl will empty back into the system; this will take a few minutes. Withdraw old cartridge using brass ring (pic 3).
Note: *To help prevent oil spill, the bag from the new replacement cartridge can be slid over filter pot and cartridge withdrawn into it.* Insert new filter element without cleaning inside the bowl and push in firmly (pic 4/5). Replace lid seal with the new one provided, (pic 6) and tighten bolt to approx 20lbs/ft. Open ball valve or restart engine and check system for leaks.

PIC 1

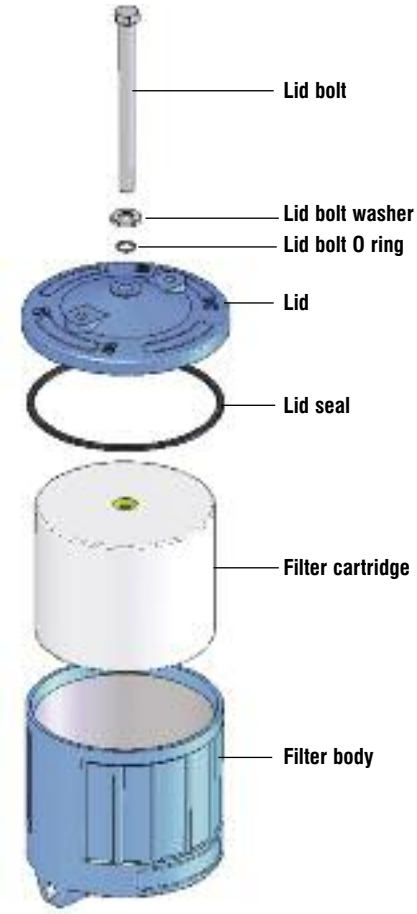
PIC 2

PIC 3

PIC 4

PIC 5

PIC 6



Heavy Duty

CARTRIDGE CHANGE GUIDELINES

Filter element life is dependant on the original oil condition. Figures given are for guidance. If the oil is very dirty, or a higher level of cleanliness is required, more element changes will be needed. However, the Filtakleen filter will always purify the oil to a safe re-usable condition, given sufficient element changes. Even totally emulsified oil will be reclaimed and purified to a better than new condition usually within 4 element changes.

Guidance for cartridge changes

ENGINES	**Filtakleen filter change**	**Main filter change**	**Oil Change**
Bantam	3000m/5000km 500 hours 3 months	2000 hours/annual	
Light	3750m/5000km 500 hours 3 months	2000 hours/annual	
Heavy	9300m/15000km 1250 hours 3 months	100000m/160000km/annual	
Maxi	15600m/25000km 1500 hours 3 months	100000m/160000km/annual	
HYDRAULICS			
Heavy	500 hours / 3 months	2000 hours/annual	10000 hours/5 years
Maxi	500 hours / 3 months	2000 hours/annual	10000 hours/5 years

Where alternate figures are shown the earliest reached should be used

ENGINES

Change Filtakleen cartridge at every service interval

Change standard oil and filter every 12 months minimum

HYDRAULICS

Change FK cartridge at every maintenance interval

Change standard full flow filters annually

SPECIFICATION

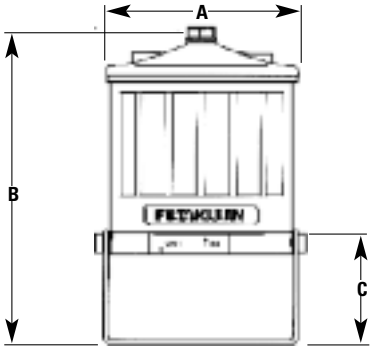
Application	Engines				Hydraulics	
Product	**Bantam**	**Light**	**Heavy**	**Maxi**	**Heavy**	**Maxi**
Kit	**FF368**	**FF668**	**FF878**	**FF988**	**FFHY778**	**FFMY788**
Filter colour	White	Red	Blue	Blue	Blue	Blue
Sump/Tank capacity	8 litre	14 litre	36 litre	72 litre	900 litre	2000 litre
Flow rate	1.5 l/min	3.0 l/min	4.5 l/min	6 l/min	4.5 l/min	6 l/min
Filter Body	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
Weight (exc fittings)	1.5 kg	1.8 kg	2.8 kg	3.9 kg	3.3 kgs	4.4 kg
Inlet connection	1/4 bsp	1/4 bsp	1/4 bsp	1/4 bsp	1/4 bsp	1/4 bsp
Outlet connection	1/4 bsp	1/4 bsp	1/4 bsp	1/4 bsp	3/8 bsp	3/8 bsp
Inlet Pressure	4.45 bar (65psi)	4.45 bar (65psi)	4.45 bar (65psi)	4.45 bar (65psi)	350 bar (5000psi)	350 bar(5000psi)
Internal pressure	4.45 bar (65psi)	4.45 bar (65psi)	4.45 bar (65psi)	4.45 bar (65psi)	4.45 bar (65psi)	4.45 bar (65psi)
Max Oil temp *	79ºC	79ºC	79ºC	79ºC	79ºC	79ºC
Viscosity range	9-220cST	9-220cST	9-220cST	9-220cST	9-220cST	9-220cST
Cartridges						
PART No	**C58**	**C68**	**HYC78**	**MYC88**	**HYC78**	**MYC88**
Height	78mm	114mm	114mm	114mm	114mm	114mm
Diameter	102mm	102mm	145mm	190mm	145mm	190mm
Filter Length	102m	114m	272M	460m	272m	460m
Surface area	80,000 sq cm	130,000 sq cm	490,000 sq cm	524,000 sq cm	490,000 sq cm	524,000 sq cm
Weight	184g	300g	630g	1060g	630g	1060g

*Recomended maximum operating temperature. Filter can operate at higher temperatures but filter life may be affected

SPARES

FF368 Bantam Duty

Description	Part number
Cartridge	C58-1717058
Lid	17-17008
Lid Seal	17-17046
Lid Bolt	17-17025
Lid Bolt	17-17051
Lid Bolt O Ring	17-17045
Dowty Seal	25131-003



Dimensions (mm)

	Bantam	Light	Heavy	Maxi
A	115	115	166	213
B	200	240	275	297
C	88	88	105	127

above sizes are approximate

SPARES continued

FF668 Light Duty

Description	Part number
Cartridge	C68-1717068
Lid	17-17005
Lid Seal	17-17046
Lid Bolt	17-17024
Lid Bolt Washer	17-17051
Lid Bolt O Ring	17-17045
Dowty Seal	25131-003

FF878 / FFHY778 Heavy Duty

Description	Part number
Cartridge	HYC78-1717078
Lid	17-17001
Lid Seal	17-17047
Lid Bolt	17-17023
Lid Bolt Washer	17-17051
Lid Bolt O Ring	17-17045

FF988/FFMY778 Maxi Duty

Description	Part number
Cartridge	MYC88-1717088
Lid	17-17002
Lid Seal	17-17048
Lid Bolt	17-17023
Lid Bolt Washer	17-17051
Lid Bolt O Ring	17-17045

Filter Fittings

Description	Part number
1/4 x 1/4 bsp male	17-17076
1/4 x 1/8 bsp male	17-17074T

Hydraulic Systems Parts

Description	Part number
Manifold Block	MYC78-1717088
1/8 x 1/4 bsp restrictor inlet adaptor	17-17084
1/8 x 3/8 bsp outlet adaptor	17-17077
1/8 Dowty Seal	14-20685
Ball Valve	17-17067A
1/4" R1 Hose	17-17059
1/4" R2 Hose	17-17058
3/8" R1 Hose	17-17057

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